Purpose of the Document:

This document is for the Mechanical Engineering Students that would like to have additional resources on their subject matter or just a quick refresher. It might be that they need another lecturer's viewpoint or similar or like me, doing a refresher and really would like a good listing of the material available on YouTube.

After two years of doing a refresh on my BSME through YouTube and directing Engineering Students on Reddit to YouTube resources, I thought that one could pretty much complete a Bachelor's of Science Degree using YouTube Videos. Here is a listing based upon Engineering Year and Semester of the appropriate classes and possible YouTube sources for said information.

Someone else (reddit user "/u/robiinn" so a big shout out to their efforts) had a bunch of the base information as a collection of good YouTube sources based upon subject matter so I had to add some more detail around certain areas.

This document is a work in progress which translates into "I haven't watched every playlist attached and cannot vouch for the quality of each and every one." There are many that I have and can say they were good enough to get the job done…however…if someone finds a "Stinker" playlist…you can get back to me reddit user "/u/mrhoa31103" with the playlist name and I'll review it…also if you find a much better one, let me know that too. The freshman, fall semester, Intro to ME, I've never had since I went through "Engineering Undeclared" at the time so I can only guess at this time what all it had in it. I put in what was rumored to be in it…trying to give a taste of ME without overloading it. Not much in YouTube land that I could find that was a course format yet be a general introduction to ME. Zach Star Videos come the closest that I could find.

Finally, do not think that you would necessarily finish this in 4 years…there are areas where multiple ME specialities are being carried along which you'd be forced to choose one over the other…for example…Thermodynamics II, Mechanics of Materials II, Control Systems, Hydraulics would be from different specialities which you couldn't do unless on the 5 year plan.

Additional Items like Job Seeking and Joining Societies timing are recommended. I have added additional resources when I came upon them…some good oases of information out there in the desert of the internet and free engineering tools when I found them (or more likely got turned onto them from someone else).

Table of Contents (and also serves nicely as the course outline and schedule)

Before you start and things you can prepare for in HS and the summer before: Suggestion start going through this list the Monday after HS Graduation.

Something Fun:
The UCL Drawing Gym is an exercise programme to help engineers improve their sketching and visualisation skills.
https://www.ucl.ac.uk/drawing-gym/

TeachEngineering – STEM Curriculum for K-12 University of Colorado - Boulder
https://www.teachengineering.org/

Why is engineering so hard? Its not what you think?: Becoming an Engineer
https://www.youtube.com/watch?v=hgyN7PkxXyU&ab_channel=BecominganEngineer
PS: Do not let this scare you away!

Study Skills:
8 Habits of Highly Successful Students: Thomas Frank
https://www.youtube.com/watch?v=JuYwsNO5XyY

College Success | Simple Book Production (lumenlearning.com)

8 Mistakes I Made as a Student: Thomas Frank
https://www.youtube.com/watch?v=-a5255bCFmA

STRESS causes DROPOUT – This is How You Fight It: Becoming an Engineer
https://www.youtube.com/watch?v=yvRuJK7OQkw&ab_channel=BecominganEngineer

Marty Lobdell – Study Less Study Smart
https://www.youtube.com/watch?v=IlU-zDU6aQ0&t=414s

> For those who don't have a single hour to "waste" – I'll still say watch Marty Lobdell!
> Study Less Study Smart: A 6-Minute Summary of Marty Lobdell's Lecture - College Info Geek: Thomas Frank (Note: He has a lot of other stuff for students…)
> https://www.youtube.com/watch?v=23Xqu0jXlfs

Study Groups (Formation and Use)
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THE DO'S AND DON'TS OF FORMING A STUDY GROUP:That Nursing Prof
https://www.youtube.com/watch?v=AfRSVf38b_Y

How to Make Group Study Sessions Actually Work: ArtofSmart
https://www.youtube.com/watch?v=4jhyhTrgyqA Opinion: Three is a bit small but I wouldn't go over five either. More people = more restrictions on a schedule slots…also you'll be a part of many groups (one for each class) and when you find people you like to work with you schedule next semester accordingly. Start time, stop times and agenda are good, I think everyone should have attempted the homework or done some sample exams first (if stuck just move on and address it at the group session), do timed sample exams in session.

7 Ways to Use a Study Group for Better Grades: Learn Law Better
https://www.youtube.com/watch?v=YQeR2gNR8kA

Exam skills: 6 tips about using study groups: BBC Learning English - Just reinforces the themes.
https://www.youtube.com/watch?v=wPBfXQHA-pc

How to reduce test prep anxiety: 3 tips from Sal Khan
https://www.youtube.com/watch?v=IZcbCnZsl5c

How to Beat Test Anxiety and Take on Exams Without Stress: Thomas Frank
https://www.youtube.com/watch?v=fHfHSq7PVDU

Study Skills: Long Beach Community College
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https://www.youtube.com/playlist?list=PLGpClaI8mTmopP6d4-EYBuWDnwg_IHZUC

Stay Organized:
7 Things Organized People Do That You (Probably) Don't Do: Thomas Frank
https://www.youtube.com/watch?v=tlFGOSEI_lo

How to Stop Wasting Time - 5 Useful Time Management Tips: Thomas Frank
https://www.youtube.com/watch?v=xwsLuxlbY2w

Build Discipline:
How to Be More DISCIPLINED - 6 Ways to Master Self Control: Thomas Frank
https://www.youtube.com/watch?v=X3vRK2P9lSU

How to Study with INTENSE Focus - 7 Essential Tips: Thomas Frank (Note: He notes work alone, I say for "Intense Focus" yes that's correct and doing this first before working any the group session.) In general, you will not need intense focus on everything.
https://www.youtube.com/watch?v=hP5TNI_2VRs

Feeling that your math skills need a quick polishing before calc 1?

Paul's Online Notes - https://tutorial.math.lamar.edu/

MTH 166: Precalculus with Trigonometry – Yiheng Wang (She has many other video series for ME)
Her MO – short to the point videos – good for review…
https://www.youtube.com/playlist?list=PLLbvVfERDon2H_IPX_0OO2GW612xM8ZY7

Precalculus- College Algebra/Trigonometry – Professor Leonard
His MO – pretty much a college course with many worked examples…He also has "Math To The Point" vids…
https://www.youtube.com/playlist?list=PLDesaqWTN6ESsmwELdrzhcGiRhk5DjwLP

Every Other Engineering Student FAQ under the Sun:

Engineering Student Tips (Engineering Career Success Tips): Jake Voorhees
https://www.youtube.com/playlist?list=PL_r1t-dwyTyW8ocwp8pgwd7VCpGu3u8W4

Engineering Resources in the Public Domain

From Engineering Library "Engineering Library provides access to a multitude of public-domain engineering resources available in one convenient location. We tracked down these valuable references and converted them into easy-to-read web pages because the team at Engineering Library believes that engineers should have access to a comprehensive, well-organized library, and it is our goal to provide that. "
Engineeringlibrary.org and https://mechanicalc.com (would not sign up as a student-just use the free stuff)

Awesome Mechanical Engineering Resources (links- free books on various subjects, calculators, useful sites)
https://github.com/m2n037/awesome-mecheng

Roymech.org (Practically a British Mark's Handbook on-line and links- free books on various subjects, calculators, useful sites). From Roymech "This site provides useful information, tables , schedules and formula related to mechanical engineering and engineering materials. It provides convenient access to data for design engineers and engineering draughtsmen. The site also lists useful engineering standards and includes equipment suppliers."
https://roymech.org/

The Engineering Toolbox
https://www.engineeringtoolbox.com/index.html

The 1% Engineers: Jake Voorhees
https://www.youtube.com/c/JakeVoorhees/playlists

ME Content - Debated where to put this one since it's got some good videos but it's all over the place on content…This one needs revisiting through out the degree since some of the videos will be over your head until the time comes…for now just click on the things of interest.

Basics of Mechanical Engineering: John Bedford Solomon
https://www.youtube.com/playlist?list=PL3qtH4RtP-D1xazLKdUeN7QExjbeuCH1n

Everything You'll Learn in Mechanical Engineering: Becoming an Engineer
https://www.youtube.com/watch?v=AwaVPJJEjAQ&ab_channel=BecominganEngineer

Websites and YouTubes I need to check out further.
Question Solutions : https://www.youtube.com/c/QuestionSolutions

Typical Engineering Analysis Programs

Excel for engineers - https://www.youtube.com/playlist?list=PLxj-gjvBzilbpFiw7nh_MCzV4vHU_nHFb - Many others out there that are more basic too. Low Cost Alternative: If you're learning on your own and do not have a budget for Microsoft, Google Sheets is making significant leaps.

Matlab introduction for beginners - https://www.youtube.com/playlist?list=PLYdXvSx87cgRJfv6gZl7GjAs0GNvyg-uS Low Cost Alternative: If you're learning on your own and do not have a budget for Matlab, use Octave instead. See Freshman Year for more information.

MATLAB Cody - MATLAB Central (mathworks.com)
Some solutions - GitHub - tuttelikz/MATLAB-Cody: Solutions to problems for Cody Challenge

MathCad - Personally I hate this program - PTC Mathcad Tutorial - Basic Math and Text [Introduction] https://www.youtube.com/watch?v=yaA7iG7NTx0&ab_channel=CreoParametric No low alternative known.

I'd recommend Engineering Equation Solver (EES) - https://www.youtube.com/playlist?list=PLD7kPnQWgv397NkfHikfps9h5cZLyAODc
No low cost alternative known.

Schamm's Outline Repository
SCHAUM'S OUTLINE - Google Drive - Subjects Trig, Thermo, Strength of Matls, Steel Design, Probability, Machine Design, Heat Transfer, Fluid Mechanics, Engineering Mechaniics, Electronics, DiffEq,Calc, and Advanced Math.

From Reddit u/KingDoken Professional Computer Engineer
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Open Textbook Library is part of the Open Education Network. This website provides various textbooks that have real ISBN numbers but they are licensed under Creative Commons. It's completely free: https://open.umn.edu/opentextbooks/

MIT Open Courseware is a great place to look at various notes, video lectures, homework, quizzes, exams, projects, etc. for a very large number of different courses from when these courses were offered in the past. Think of it as being enrolled in a course, but you're just there to see everything and not being graded. https://ocw.mit.edu/

The EBooks Foundations is an open source, open information advocate organization. A lot of people contribute to provide free resources online. https://ebookfoundation.org

* Directory of Open Access Books (Over 66,000 academic peer-reviewed books)
https://doabooks.org/

Here's a GitHub repository for topics in coding: https://github.com/EbookFoundation/free-programming-books/blob/main/books/free-programming-books-subjects.md

Here's another GitHub repository for specific coding languages: https://github.com/EbookFoundation/free-programming-books/blob/main/books/free-programming-books-langs.md

Here's another GitHub repository for various mathematics, sciences, and philosophy: https://github.com/EbookFoundation/free-science-books/blob/master/free-science-books.md

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Freshman Year [Year 1 for International Students]

Advice from u/MustardMan007

I just finished the first year of my career in mechanical engineering. Figured I'd circle back around and offer some advice. For context, I work in the downstream oil and gas industry as a reliability engineer. Here's some advice I wish I had while I was in school:

-***Try to enjoy college.*** This is a fantastic time to explore who you are, figure out what your interests outside of school are, and develop lifelong friendships. You are there to study, yes, but you're also still living your life. Enjoy it.

-Develop your social and interpersonal skills. There are too many engineers that struggle in their careers simply because they don't know people. You are going to ask 10 people for 20 things every single day. Learn how to get people to want to help you rather than being a thorn in their side.

-Pursue real world experience through internships. I'm going to be honest, your 4.0 GPA does not impress me. Your experience in streamlining a process, implementing a program, or otherwise adding value to a company impresses me. You need to add more value than you are taking home in pay.

-Who you know matters I only got my current job because I networked through a classmate that had previously gotten an internship at this company. This all ties back into enjoying your time in college, meeting new people, and building a network of people that can support you.

Top 10 CRUCIAL tips for every freshman engineering student: Becoming an Engineer
https://www.youtube.com/watch?v=9rt2OJuXxZg&ab_channel=BecominganEngineer

Fall Semester

Humanities 1 – Composition

What is Technical Writing? (Business Writing for Engineers)
https://www.youtube.com/watch?v=Tie6CHqTbms

LEADERSHIP LAB: The Craft of Writing Effectively
https://www.youtube.com/watch?v=vtIzMaLkCaM

Introduction to Engineering/Engineering Undeclared/ME – Do I want to be a ME?

Zach Star:
https://www.youtube.com/playlist?list=PLi5WqFHu_OJOkwyeHyD06tPyJ_srHC4ZU

The 1% Engineers: Jake Voorhees
https://www.youtube.com/c/JakeVoorhees/playlists

National Bureau of Labor Statistics: Mechanical Engineering (and any other engineering flavor you want to research)
https://www.bls.gov/ooh/architecture-and-engineering/mechanical-engineers.htm

5 Most Important Skills for a Mechanical Engineer to Succeed | Mechanical Engineering Skills: Explorist
https://www.youtube.com/watch?v=gHSZ1S9996U&ab_channel=Explorist

Don't Let These Things Discourage You From Engineering: Zach Star
https://www.youtube.com/watch?v=OBJOLJDkHG8&ab_channel=ZachStar
and https://youtu.be/hzBCI13rJmA

Introduction to Programming (MATLAB(Octave is a no-cost option), Python)

Octave Tutorials: Paul Nissenson - (Truly Beginning Programming)
https://www.youtube.com/channel/UCr-6gDvh0atAFM4VuYq7PHw/playlists

Matlab introduction for beginners: Dean Clark
https://www.youtube.com/playlist?list=PLYdXvSx87cgRJfv6gZl7GjAs0GNvyg-uS
You can look for more at the "Mathworks Channel"

Introduction to Matlab Programming for Engineerings and Scientists: Mahdi Farahikia
https://www.youtube.com/playlist?list=PLQVMpQ7G7XvErik52PMtk0Bu7ACnNvmd2

Python
sentdex:
https://www.youtube.com/playlist?list=PLQVvvaa0QuDe8XSftW-RAxdo6OmaeL85M

Introduction to Mechanical Engineering Drawings and reference to Solidworks

Engineering Drawing/Engineering Graphics – Manas Patnaik -
https://www.youtube.com/playlist?list=PLIhUrsYr8yHwDUrVYmUNYkEeZgZTvoIfS

Isometric drawing example 3 – Yiheng Wang (Hopefully she makes more videos)
https://www.youtube.com/watch?v=3rW9-Z-_wOQ

Blueprint Reading: Unit 2: Multiview Drawings:SkagitValleyCollege
https://www.youtube.com/watch?v=1roPfzjHXnM&ab_channel=SkagitValleyCollege

Orthographic Projection 1: Thomas Sheppard
https://www.youtube.com/watch?v=68uU_MSmtkc&ab_channel=ThomasSheppard

and several others…

Orthographic Projection 7: 1st and 3rd angle: Thomas Sheppard
https://www.youtube.com/watch?v=NamnUf0NQrI&ab_channel=ThomasSheppard
More advanced drawing stuff
MEEN 426: Intro to Geometric Dimensioning and Tolerancing: TheBOM_PE
https://www.youtube.com/playlist?list=PL1IHA35xY5H7HomHQY9nDwifWYvH_Aa1n

Fits and Tolerances (Revisit this one in your Senior Design Project 😊)
Fits and Tolerances: How to Design Stuff that Fits Together
https://www.youtube.com/watch?v=2429BVMrZ4A&ab_channel=tarkka

Solidworks (CAD program) and learning it.
For all of you not in University , where you can get Solidworks license through the Uni, you get can get Student Solidworks currently for $40 USD per year membership fee by joining the Experimental Aircraft Association at www.eaa.org. Once you're a member look here: https://www.eaa.org/eaa/eaa-membership/eaa-member-benefits/solidworks-resource-center and you can learn Solidworks and others through: https://www.youtube.com/user/vertanux1

AutoCAD - AutoCAD Tutorial for Mechanical Engineering: CAD CAM Tutorials
https://www.youtube.com/playlist?list=PLrOFa8sDv6jfA_7hRj94PBu2MUhjBPBfa
There are also many other "AutoCAD" like CAD programs out there...like NanoCAD and Draftsight which once you graduate you might look at...but most likely you'll just use a full 3D package instead. I know why they teach 2D stuff...I personally design sketch in 2D and then implement in 3D solid modelling once I have thought through the device operation and done some 2D layout stuff.

Engineering Problem Solving I and II: TheBOM_PE (Freshman Elective)

I) 8 Videos: First freshman "living with the lab" course focusing on basic circuit analysis, Arduino microcontrollers, spreadsheets (including regression analysis), and energy conversion efficiency https://www.youtube.com/playlist?list=PL1IHA35xY5H55-AcO5Vn-51AFGX3aJwfb
II) 30 Videos: Second freshman "living with the lab" course focusing on mass & energy balances and system measurement and control https://www.youtube.com/playlist?list=PL1IHA35xY5H4g1F-lGnVyGjR59sirWydD

Calc 1

patrickJMT:
https://www.youtube.com/playlist?list=PL58C7BA6C14FD8F48

Professor Leonard:
Full videos. https://www.youtube.com/playlist?list=PLF797E961509B4EB5
Playlist 1. https://www.youtube.com/playlist?list=PLD7F5E25BF583F56B

Playlist 2. https://www.youtube.com/playlist?list=PLF0621D7720431053

The Organic Chemistry Tutor:
https://www.youtube.com/playlist?list=PL0o_zxa4K1BWYThyV4T2Allw6zY0jEumv

MathDoctorBob:
https://www.youtube.com/user/MathDoctorBob/playlists

blackpenredpen:
https://www.youtube.com/user/blackpenredpen/playlists

Krista King:
https://www.youtube.com/user/TheIntegralCALC/playlists?view=50&flow=grid&shelf_id=22

Jamie Mulholland:
https://www.youtube.com/channel/UCOZJyVA526SlYB7e-p5RRMg/playlists?view=50&sort=dd&shelf_id=6

NancyPi:
https://www.youtube.com/channel/UCRGXV1QlxZ8aucmE45tRx8w/playlists

Calc1 Practice Problems and Notes –
Paul's Online Notes - https://tutorial.math.lamar.edu/Problems/CalcI/CalcI.aspx

Chem 1

Chem Lab 1

LearnChemE:
https://www.youtube.com/playlist?list=PL4xAk5aclnUi1CEFNwjcheMgyWe8BwuLS

TMP Chem:
https://www.youtube.com/user/TMPChem/playlists

Professor Dave Explains:
https://www.youtube.com/channel/UC0cd_-e49hZpWLH3UIwoWRA/playlists?view=1&sort=dd&shelf_id=0

Khan Academy:
https://www.youtube.com/user/khanacademy/playlists?view=50&flow=list&shelf_id=9

General Market Economics

The Organic Chemistry Tutor:
https://www.youtube.com/playlist?list=PL0o_zxa4K1BVN1xLJFMz7NlwTDaAa2Lbj

Khan Academy:
https://www.youtube.com/user/khanacademy/playlists?view=50&flow=list&shelf_id=11

Economics in Many Lessons:
https://www.youtube.com/user/1sportingclays/playlists

Policonomics:
https://www.youtube.com/user/policonomicsvideos/playlists

Economicsfun:
https://www.youtube.com/user/economicsfun/playlists

PE – Go get some exercise and socializing.

Start looking for next May Engineering Internships by going to Job Fairs and investigating your local areas for possible positions.

How To Find + Get An Engineering Internship (My Tips + Tricks) - Eggs the Engineer <- Looks like he has other good stuff on his YouTube HomePage be sure to check it out.
https://www.youtube.com/watch?v=i_-Oyk2XJzk

How To Become An Engineer - YouTube from Eggs the Engineer…

Spring Semester

Humanities 2 – Global Issues (but I'm going to also add speaking)

The surprising secret to speaking with confidence: TEDxBrixton
https://www.youtube.com/watch?v=a2MR5XbJtXU

Five Basic Public Speaking Tips – Toastmasters International
https://www.youtube.com/watch?v=AykYRO5d_II

How To Speak by Patrick Winston
"Your success in life will be determined largely by your ability to speak, your ability to write and the quality of your ideas, in that order."
https://www.youtube.com/watch?v=Unzc731iCUY&list=TLPQMTkxMDIwMjDBeWXj33iYEw&index=9
then practice, practice, practice …

Calc 2

patrickJMT:
https://www.youtube.com/playlist?list=PLD371506BCA23A437

Professor Leonard: https://www.youtube.com/playlist?list=PLDesaqWTN6EQ2J4vgsN1HyBeRADEh4Cw-

The Organic Chemistry Tutor:
https://www.youtube.com/playlist?list=PL0o_zxa4K1BWYThyV4T2Allw6zY0jEumv

MathDoctorBob:
https://www.youtube.com/user/MathDoctorBob/playlists

blackpenredpen: (check out the marathons for test prep)
https://www.youtube.com/user/blackpenredpen/playlists

Krista King:
https://www.youtube.com/user/TheIntegralCALC/playlists?view=50&flow=grid&shelf_id=23

Jamie Mulholland:
https://www.youtube.com/channel/UCOZJyVA526SlYB7e-p5RRMg/playlists?view=50&sort=dd&shelf_id=3

NancyPi:
https://www.youtube.com/channel/UCRGXV1QlxZ8aucmE45tRx8w/playlists

Calc2 Practice Problems and Notes –
Paul's Online Notes - https://tutorial.math.lamar.edu/Problems/CalcII/CalcII.aspx

Physics 1

Physics Lab 1

MIT OpenCourseWare:
https://ocw-origin.odl.mit.edu/courses/find-by-topic/

Michel van Biezen:
https://www.youtube.com/user/ilectureonline/playlists
How to Find the Playlists on Physics. https://www.youtube.com/playlist?list=PLX2gX-ftPVXWS5VpIQKmQerqthSmUTLtY

Lectures by Walter Lewin:
https://www.youtube.com/channel/UCiEHVhv0SBMpP75JbzJShqw/playlists

Step-by-Step Science:
https://www.youtube.com/user/bhswarthout/playlists

lasseviren1:
https://www.youtube.com/user/lasseviren1/videos

Adam Beatty:
https://www.youtube.com/user/youspinmerightrounds/playlists

TheBom_PE:
https://www.youtube.com/channel/UCpDljJAHaKMakrQFFX5fRDg/playlists?view=1&sort=dd&shelf_id=0

NPTEL:
https://www.youtube.com/user/nptelhrd/playlists

Linear Algebra

patrickJMT:
https://www.youtube.com/playlist?list=PLAFEC355DFEADC30C

MIT Linear Algebra Lectures (Prof. Gilbert Strang):
https://www.youtube.com/playlist?list=PL41A1C92F1766D4AB

MathDoctorBob:
https://www.youtube.com/playlist?list=PL774A268635BA8AAD

3B1B:
https://www.youtube.com/playlist?list=PLZHQObOWTQDPD3MizzM2xVFitgF8hE_ab

Steve Brunton: He calls it “Linear Algebra” but it’s really advanced Linear Algebra!!
https://www.youtube.com/playlist?list=PLMrJAkhIeNNRjxJ_sMtJ02geqw_-vuB7O

Engineering Problem Solving III: TheBOM_PE (Freshman Elective)

40 Videos: Third freshman "living with the lab" course focused on basic statics, basic engineering economics, and innovative product design and development
https://www.youtube.com/playlist?list=PL1IHA35xY5H52IKu6TVfFW-BDqAt_aZyg

PE – Go get some exercise and socializing.

Find and Join Technical Societies (SAE, SME, ASME, or whatever looks fun)…Check out the Society Competions for Interest Levels.

Summer Internship – Read This Again One Week Before You Start!!!

How To Intern: The Do's And Don'ts Of Interning – JackieFern - This is a newscaster talking about interning…a good example of what to do in general and that all information doesn't need to come from "engineering" AKA – Learn People skills from People Persons (not Engineers)
https://www.youtube.com/watch?v=l78kYyqw_IM

5 Ways to Be a Great Intern! | The Intern Queen - Another set of good examples – not an engineering video but great advice. - Lauren Berger
https://www.youtube.com/watch?v=VNSe2kcqO9w

5 Things You Should Not Do at Your Internship! | The Intern Queen - Lauren Berger
https://www.youtube.com/watch?v=i2str4aoxsc

How to Outperform on Your Internship (10 TIPS!) - Afzal Hussein
https://www.youtube.com/watch?v=O7FI6ODafTk

Sophomore Year [Year 2 for International Students]

Fall Semester

Humanities 3 – Creative Thinking

A crash course in creativity: Tina Seelig at TEDxStanford
https://www.youtube.com/watch?v=gyM6rx69iqg&ab_channel=TEDxTalks

7 steps of creative thinking: Raphael DiLuzio at TEDxDirigo
https://www.youtube.com/watch?v=MRD-4Tz60KE&ab_channel=TEDxTalks

Seven Habits of Highly Creative People | Dr. Pavan Soni | TEDxIBSPune
https://www.youtube.com/watch?v=LmXGvsuNDv8&ab_channel=TEDxTalks

The art of innovation | Guy Kawasaki | TEDxBerkeley
https://www.youtube.com/watch?v=Mtjatz9r-Vc&ab_channel=TEDxTalks

Start with the Why ted talk - Simon Sinek
Long Version - https://www.youtube.com/watch?v=nokBj14p4Mc&ab_channel=USIEvents
Med Version - https://www.youtube.com/watch?v=u4ZoJKF_VuA&ab_channel=TEDxTalks
Short Version - https://www.youtube.com/watch?v=IPYeCltXpxw&ab_channel=ChicoLima

Calc 3

patrickJMT:
https://www.youtube.com/playlist?list=PLF83D74BA4DE75897

Professor Leonard: https://www.youtube.com/playlist?list=PLDesaqWTN6ESk16YRmzuJ8f6-rnuy0Ry7

The Organic Chemistry Tutor:
https://www.youtube.com/playlist?list=PL0o_zxa4K1BWYThyV4T2Allw6zY0jEumv

MathDoctorBob:
https://www.youtube.com/user/MathDoctorBob/playlists

blackpenredpen:
https://www.youtube.com/user/blackpenredpen/playlists

Krista King:
https://www.youtube.com/user/TheIntegralCALC/playlists?view=50&flow=grid&shelf_id=24

Calc3 Practice Problems and Notes –
Paul's Online Notes - https://tutorial.math.lamar.edu/Problems/CalcIII/CalcIII.aspx

Below From https://www.reddit.com/user/calebuic/

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Made a Multivariable Calculus (Calc 3) doc with problems and solutions.

I'd thought I'd share this link that covers topics that will be on my exam today. Problems are from MIT OpenCourseWare and the Calc 3 support class that I take. Here's the link and I hope it helps everyone who sees it! I want to do more like these. The only thing that it's missing is some chain rule problems at the moment:

https://drive.google.com/file/d/1oD0HwXzyHYNGxNisceyTuJfNxhqMDkKP/view?usp=drivesdk

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Physics 2 (must have passed Calc 2)

Physics Lab 2

Waves and Optic

Adam Beatty:

https://www.youtube.com/playlist?list=PL610B4A2EC43A9434

Michel van Biezen: https://www.youtube.com/playlist?list=PLX2gX-ftPVXWA5TjEhVQSQQzZ-5_5Nui8

And

PHYSICS – Electricity and Magnetisms, Optics, Atomic and Nuclear Physics, Quantum & Adv Mechanics:
Michel van Biezen: https://www.youtube.com/c/MichelvanBiezen/playlists

Tutorials Point (India) Pvt. Ltd.:

https://www.youtube.com/playlist?list=PLWPirh4EWFpFWhPippga6iLmdE0MmSC4o

Statics (must have passed Calc 2)

Jeff Hanson:

https://www.youtube.com/playlist?list=PLRqDfxcafc23LXGoItpkYMKtUdHaQwSDC

[2015] Engineering Mechanics – Statics: Yiheng Wang (This one is good for reviewing since it has short videos – review by working the problems before having her explain it. Answers for additional questions are given in the "Show More" section.)

https://www.youtube.com/playlist?list=PLLbvVfERDon3mb73rkKIeFA8Q7yt-7tku

Additional Problems with Solutions - https://www.youtube.com/playlist?list=PLLbvVfERDon3-tWToiyfCZJggNh9O7xjg

structurefree:

statics. https://www.youtube.com/playlist?list=PL6474BBA9E3FC8FDC
Structural Analysis. https://www.youtube.com/playlist?list=PL1DE2AA99E4258070

Engineer4Free:
Statics. https://www.youtube.com/playlist?list=PLOAuB8dR35oeXMk2C5fjHP2K306hGfk_w
Structural Analysis. https://www.youtube.com/playlist?list=PLOAuB8dR35oe8lcGo-ic-f5HdxpXEanvb

FinalAnswer:
https://www.youtube.com/user/daxterbelstutoring/playlists?view=50&sort=dd&shelf_id=2

CPPMechEngTutorials:
https://www.youtube.com/playlist?list=PLZOZfX_TaWAEzhyvNT1e9jbmTt4Eqo8C0

UWMC Engineering:
https://www.youtube.com/playlist?list=PLmjeuPDHP7zD7ogEGP0aaBDqYDAVu-yT3

Randall Manteufel:
https://www.youtube.com/playlist?list=PL_ZIJMd-rNhX5-pdt6M1tfHCdym4SdFXW

Useful Tools
MDSolids 4.1.0 https://web.mst.edu/~mdsolids/download.htm registration code D93C8ADC for Truss Calculation Verification – Learn it before using this program otherwise you've made a crutch for yourself.

Material Science

NPTEL – Short Course
https://www.youtube.com/playlist?list=PLyAZSyX8Qy5C8ciqBBlypbx91j4nowUbL

NPTEL – Super Long Course
https://www.youtube.com/playlist?list=PLyAZSyX8Qy5Am_2StOOQ5vCUE3VIcAenE

My actual class was somewhere between these in complexity…

ME Practice I (must have completed – Humanities 1) – Mechanical Lab Practices and Reporting

This Is What My College Engineering Lab Reports Looked Like: Zach Star
https://www.youtube.com/watch?v=jhZISoSnSQk&ab_channel=ZachStar

Mechanical Measurement System:NPTEL

https://www.youtube.com/playlist?list=PLSGws_74K019wiWyVU3CnVMMqAcF3_sxz

PE – Go get some exercise and socializing.

Start looking for next May Engineering Internships by going to Job Fairs and investigating your local areas for possible positions.

How to Answer Behavioral Interview Questions Using the STAR Method (Top !0 Behavioral Questions) : Don Georgevich
https://www.youtube.com/watch?v=WSbN-0swDgM

5 Things You Should Never Say In a Job Interview: Don Georgevich
https://www.youtube.com/watch?v=wIjK-6Do6lg

12 Things That Ruin A First Impression Immediately
https://www.youtube.com/watch?v=JrbnTZPjg0k

Zoom Interview Tips | Strategies for Acing Online Interviews and Calls
https://www.youtube.com/watch?v=69AOXIM4FXY

Spring Semester

Humanities 4 – Social Responsibility and Ethical Reasoning (AKA - Ethics)

Engineering Ethics – Michael C. Loui
https://www.youtube.com/playlist?list=PL746AE3CCB29B64B8

Look up "Engineering Ethics Case Studies" on YouTube after that…there's not a playlist.

ENGR 452 Lecture 04: Engineering Ethics: Gregory Michaelson (This is a Civil Engineering Class but Ethics are the same!)
https://www.youtube.com/watch?v=RL7afRhniYo&t=1s

Ordinary Differential Equations (must have passed Calc 2 and Linear Algebra)

patrickJMT:
https://www.youtube.com/playlist?list=PLD4B0062CA82D73FB

Professor Leonard:
https://www.youtube.com/playlist?list=PLDesaqWTN6ESPaHy2QUKVaXNZuQNxkYQ_

3B1B:
https://www.youtube.com/playlist?list=PLZHQObOWTQDNPOjrT6KVlfJuKtYTftqH6

MathDoctorBob:
https://www.youtube.com/playlist?list=PLA7FDE7518E52863A

Notes:
Paul's Online Notes: https://tutorial.math.lamar.edu/Classes/DE/DE.aspx I'm assuming someday he'll get around to sample problems and such.

Dynamics (must have completed Physics 1) and Kinematics

Jeff Hanson:
https://www.youtube.com/playlist?list=PLRqDfxcafc206fNQPkcBUFEMYje-UjtqA

ME274: Colin Selleck
Dynamics (Hibbler I do not know which edition but seems similar but not exact to the 14th Edition I have.) Just runs through the standard chapter slides…you're left to go do the problems and examples from the book. A good set if your instructor is terrible but uses Hibbler.
https://www.youtube.com/playlist?list=PLhEbkWH-e43396vLND_DAljwotkRjfLCA

[2015] Engineering Mechanics – Dynamics: Yiheng Wang (This one is good for reviewing since it has short videos – review by working the problems before having her explain it. Answers for additional questions are given in the "Show More" section.
https://www.youtube.com/playlist?list=PLLbvVfERDon1xk3wGaYfXSmGa1u83mGn-
Also has a review guide - https://www.youtube.com/watch?v=moMh_gW35Ko
Additional Problems with Solutions - https://www.youtube.com/playlist?list=PLLbvVfERDon3-tWToiyfCZJggNh9O7xjg

structurefree:
Engineering Dynamics. https://www.youtube.com/playlist?list=PL81251F4A3D0AF09B

FinalAnswer:
https://www.youtube.com/user/daxterbelstutoring/playlists?view=50&sort=dd&shelf_id=3

Engineering Mechanics II – Dynamics: K.S. Manning PhD
https://www.youtube.com/playlist?list=PLsZPMbXU6KR7AkRfYaKIBzoITiLgOwJx2

Engineering Mechanics – Dynamics: Scott Reckinger
https://www.youtube.com/playlist?list=PLsjoIkhly-oDWztiNN07DDcKVw7inxgUW

UWMC Engineering:
https://www.youtube.com/playlist?list=PLmjeuPDHP7zCJnea2qRaf74yDxSuMCK_t

TheBom_PE:
https://www.youtube.com/playlist?list=PL1IHA35xY5H6G64khh8fcNkjVJDGMqrHo

Questions Solutions:
https://www.youtube.com/playlist?list=PLXePpKFSUW2ZXw_D5h0TTyac-KGlFRxnS

Linkage Mechanism Designer and Simulator: Dave's Blog (I have not tried it but looks nice.)
https://blog.rectorsquid.com/linkage-mechanism-designer-and-simulator/

A bunch of mechanism animations: Makine Eğitim
https://www.youtube.com/playlist?list=PLrIPuZH5a-80vHE76OqxU1T0HiDsO23jl

Free Book: Mechanics of Machines Ver2.1 by Doughty (Looks like a good one – a little dated 1988 – has a section on applied vibrations in machines which may be unique.)
https://www.mekanizmalar.com/mechanics-of-machines.html

Intro to Thermodynamics, AKA Thermo 1 (must have passed Chem 1 and Calc 2)
Thermo Lab 1 (AKA ME Practice 2)

CPPMechEngTutorials:
https://www.youtube.com/playlist?list=PLZOZfX_TaWAH3zDurz4ds7jMFzhxhfKZV

A steam table interpolator tool (complements of reddit u/mrguneer135) and he'd like some feedback on it.
http://www.steam-tables.com/

Randall Manteufel:
https://www.youtube.com/playlist?list=PL_ZIJMd-rNhUYw-usVCZIdoTaiyG4vp2S

LearnChemE:
https://www.youtube.com/user/LearnChemE/playlists?view=50&flow=grid&shelf_id=11

Ron Hugo:
https://www.youtube.com/channel/UCrRKDc1uHcif575CQexIA5Q/playlists?view=50&flow=grid&shelf_id=5

UWMC Engineering:
https://www.youtube.com/playlist?list=PLmjeuPDHP7zAgkbNhvk8l9udV5Uu9Uxas

Mechanics of Materials 1 (AKA Solids or Strength of Materials)

Solids Jeff Hanson:

https://www.youtube.com/watch?v=RkS8DjzvEvM&list=PLRqDfxcafc21wlI3E56IkDmRJ-33apMjv&ab_channel=JeffHanson

EGR 246: Mechanics of Materials: Yiheng Wang (This one is good for reviewing since it has short videos – review by working the problems before having her explain it.)
https://www.youtube.com/playlist?list=PLLbvVfERDon3oDfCYxkwRct1Q6YeOzi9g

CPPMechEngTutorials:
Strength of Materials I - Dr. Izadi Lecture Series - YouTube and
Strength of Materials II: Dr. Mohammad Izadi's Lecture Series - YouTube

Materials Laboratory Testing

Tensile Test: MaterialsScience2000
https://www.youtube.com/watch?v=D8U4G5kcpcM

Charpy Impact Test: MaterialsScience2000
https://www.youtube.com/watch?v=tpGhqQvftAo

Izod & Charpy Impact Test !! ||Engineer's academy||
https://www.youtube.com/watch?v=T3tc33pd3hQ

Fatigue Test: MaterialsScience2000 (More exposure to design for fatigue during Machine Design Class)
https://www.youtube.com/watch?v=LhUclxBUV_E

structurefree:
https://www.youtube.com/playlist?list=PLCBF826FE563C57B0

UWMC Engineering:
https://www.youtube.com/playlist?list=PLmjeuPDHP7zCvwGxZUxQcmRxMFdP5DQO
Useful Tools
MDSolids 4.1.0 https://web.mst.edu/~mdsolids/download.htm registration code D93C8ADC

PE – Go get some exercise and socializing.

Summer Internship – See Freshman Year Stuff and Work On Your Presentation Skills

Junior Year [Year 3 for International Students]

Fall Semester

Humanities 5 – Technical Writing

What is Technical Writing? (Business Writing for Engineers)
https://www.youtube.com/watch?v=Tie6CHqTbms

The Craft of Writing Effectively
https://www.youtube.com/watch?v=vtIzMaLkCaM

Introduction to Research – I – Publishing in Journals (Long Preamble – starts basically at 14:11, Parts of the paper – 26:16 to 51.21, Summary) - Not the greatest video I'll admit.
https://www.youtube.com/watch?v=NM53k7x_jjk

Fluid Mechanics

CPPMechEngTutorials:
Fluid Mechanics I: https://www.youtube.com/playlist?list=PLZOZfX_TaWAGocs2k5QmTL44OKOl7rn34

Fluid Mechanics: https://www.youtube.com/playlist?list=PLZOZfX_TaWAH0baRhA8OosWVbEsJK5sPe

Randall Manteufel:
https://www.youtube.com/playlist?list=PL_ZIJMd-rNhUU3-ED5_yT8LXEnSCw6Wy2

LearnChemE:
https://www.youtube.com/user/LearnChemE/playlists?view=50&flow=grid&shelf_id=5

Ron Hugo:
https://www.youtube.com/channel/UCrRKDc1uHcif575CQexIA5Q/playlists?view=1&sort=dd&shelf_id=0

Learn Fluid Mechanics Series: learnfluidmechanics
https://www.youtube.com/playlist?list=PLYW-sQK8vo9BxngatMoW1Zvr3nKNRbAyZ

Fluid Mechanics: Dr. Firat Testik from The University of Texas at San Antonio (UTSA)
https://www.youtube.com/playlist?list=PL780bLd7HstD4gD37ZKPB3HjEyfjqCKVo

Introduction to Fluid Mechanics Laboratory(ENGR 3404]:
https://www.youtube.com/playlist?list=PLXZrj33lBR1rG6NdSsgqbnunVS0Q3BjWD

Fluid Mechanics FE Review
https://www.youtube.com/playlist?list=PLCCmgp4iMmxiK5gLBD6hjrgbWubluru2Gube

Introduction to Vibrations (AKA Dynamic Systems or System Dynamics)
Vibration Lab (AKA ME Practice 3)

CPPMechEngTutorials: Noori
https://www.youtube.com/playlist?list=PLWqFWuIMqmHTBPgqwabliwB4EOR02nMr-

Mechanical Vibrations: Jurnan Schilder:
https://www.youtube.com/playlist?list=PLMXj6GKKnHI6Lftj7CXr9WusMkXi5s9yH

Engineering Economic Decision Analysis(AKA Eng Econ -NPV, NFV, Depreciation, etc.)

Engineer4Free:
https://www.youtube.com/playlist?list=PLOAuB8dR35oeZR8OexafgBb0Y-nE3QqCP

Statistics

Professor Leonard:
Statistics Playlist 1 https://www.youtube.com/playlist?list=PL5901C68C96DFCAD1
Statistics (Full Length Videos) https://www.youtube.com/playlist?list=PL5102DFDC6790F3D0

The Organic Chemistry Tutor:
https://www.youtube.com/playlist?list=PL0o_zxa4K1BVsziIRdfv4Hl4UIqDZhXWV

MathDoctorBob:
https://www.youtube.com/playlist?list=PL39A63114C97E5C10

Khan Academy:
https://www.youtube.com/playlist?list=PL1328115D3D8A2566

Brandon Foltz:
https://www.youtube.com/user/BCFoltz/playlists

The Stats Files - Dawn Wright Ph.D.:
https://www.youtube.com/channel/UCN9jJ__WlmK920O-wt-QMyA/playlists

Internet Book on Statistics - https://courses.lumenlearning.com/introstats1/

Application of Statistics for
ME…http://faculty.washington.edu/fscholz/DATAFILES498B2008/TolerancingStat498B.pdf

Partial Differential Equations including Laplace Transforms and Fourier Series

PDE's Introduction

Michel van Biezen:
https://www.youtube.com/playlist?list=PLX2gX-ftPVXVaWPBd1I4A2dcIeAtxIdPf

Laplace Transforms
Khan Academy:
https://www.youtube.com/results?search_query=laplace+khan+academy

Fourier Series
Khan Academy:
https://www.youtube.com/watch?v=UKHBWzoOKsY&ab_channel=KhanAcademy

Notes:
Paul's Online Notes: https://tutorial.math.lamar.edu/Classes/DE/DE.aspx I'm assuming someday he'll get around to sample problems and such.

Electrical Circuits 1 with EE Circuits 1 Lab

Introduction to Electric Circuits: Smith Kerona
https://www.youtube.com/playlist?list=PL8kq5qsK0cc42p-m3eGHiuCi3Xr_ORv9W

Not on YouTube so I don't know whether it will stick around and may be a EE Course
http://www.infocobuild.com/education/audio-video-courses/electronics/ee44-circuits-and-systems-caltech.html

Razavi:
Electronics. https://www.youtube.com/playlist?list=PL7qUW0KPfsIIOPOKL84wK_Qj9N7gvJX6v
Electronics 2. https://www.youtube.com/playlist?list=PLm2lpI_krGU5p0EHm1MArCs4hb99KOVzp

Neso Academy:
https://www.youtube.com/user/nesoacademy/playlists?view=50&sort=dd&shelf_id=8

Understanding Motors: Jantzen Lee – Quick Hitting Explanation of Motors/Commutation/Control
https://www.youtube.com/playlist?list=PLaBr_WzeIAixidGwqfcrQlwKZX4RZ2E7D

Tool: Free Circuit Simulators
http://www.falstad.com/circuit/

TINA-TI Simulation tool | TI.com - SPICE-based analog simulation program

PE – Go get some exercise and socializing.

Start looking for next May Engineering Internships by going to Job Fairs and investigating your local areas for possible positions.

See references in Freshman and Sophomore Year….

Spring Semester

Heat Transfer

CPPMechEngTutorials:
https://www.youtube.com/playlist?list=PLZOZfX_TaWAE6nTX50dJl0Jia8iQTIhrG

Randall Manteufel:
https://www.youtube.com/playlist?list=PL_ZIJMd-rNhUm2lvq1GY21Y8U5mJnDdAH

LearnChemE:
https://www.youtube.com/playlist?list=PL242066E80621CC10

Ron Hugo:
https://www.youtube.com/channel/UCrRKDc1uHcif575CQexIA5Q/playlists?view=1&sort=dd&shelf_id=0

Joshua Meyer:
https://www.youtube.com/user/HeatTransferUP/playlists

Heat Transfer Tools (IHT4.0 - Interactive Heat Transfer)
(note: load IHT3.0 first in same directory as IHT4.0 so that IHT4.0 runs without file errors – this link is the IHT3.0 link - the other way to do it – is copy the files IHT4.0 complains about not finding from IHT3.0 files to IHT4.0 directory)
Bergman, Lavine, Incropera, DeWitt: Fundamentals of Heat and Mass Transfer, 7th Edition - Student Companion Site (wiley.com)
(this is the IHT4.0 link)
Bergman, Lavine, Incropera, DeWitt: Fundamentals of Heat and Mass Transfer, 7th Edition - Student Companion Site (wiley.com)

Dynamic Systems and Control

Controls Lab (AKA ME Practice 4)

Brian Douglas:
https://www.youtube.com/playlist?list=PLUMWjy5jgHK1NC52DXXrriwihVrYZKqjk

Control Bootcamp: Steve Brunton - Start Here
https://www.youtube.com/playlist?list=PLMrJAkhIeNNR20Mz-VpzgfQs5zrYi085m
Steve Brunton: Other Opportunities
https://www.youtube.com/channel/UCm5mt-A4w61lknZ9lCsZtBw/playlists

katkimshow:
https://www.youtube.com/user/katkimshow/playlists

John Rossiter:
https://www.youtube.com/channel/UCMBXZxd-j6VqrynykO1dURw/playlists

Textbook I found: http://www.cds.caltech.edu/~murray/books/AM08/pdf/am08-complete_09Aug12.pdf Please follow the guidelines, personal review and no replication. Just use the site.

Introduction to Manufacturing Practices (must have completed Material Science)

NPTEL:
https://www.youtube.com/playlist?list=PLSGws_74K01-g9nnTMBssGURHawYYQfMQ

Introduction to Machine Design Elements

MEEG 4104 – Machine Element Design: David Jensen
https://www.youtube.com/playlist?list=PLKz_xsS_duovIcKifF1vL_qE8xDoocWf5

ENGR380(2017W): Yang Cao
https://www.youtube.com/playlist?list=PLJzZfbLAMTem4bgl5fomdpLHwX2ZxBm3E

MEEN 462: Machine Element Design: TheBom_PE
https://www.youtube.com/playlist?list=PL1IHA35xY5H5KqySx6n09jaJLUukbvJvB

MEEN 426: Intro to GD&T: TheBom_PE
https://www.youtube.com/playlist?list=PL1IHA35xY5H7HomHQY9nDwifWYvH_Aa1n

Machine Design Lectures: Brandon Adame (CPPMechEngTutorials)
https://www.youtube.com/playlist?list=PLuJciMW_zeCS3hwF4eRL8L31Wo3VOyrt7

Bolts – Yes they're that important
Bolt Calculation 3D Animation with Blender 3D: MGINEER3D
https://www.youtube.com/watch?v=-gptqNildV4&ab_channel=Nord-LockGroup

What is Torque? – Fastening Theory Part 1: Flexible Assembly Systems Inc
https://www.youtube.com/watch?v=kTwpA2yJ81o&ab_channel=FlexibleAssemblySystemsInc

Friction Factors – Fastening Theory Part 2: Flexible Assembly Systems Inc
https://www.youtube.com/watch?v=fN9b3ByRh7A&ab_channel=FlexibleAssemblySystemsInc

Rumor has it that this document is the bible for bolted joints
https://standards.nasa.gov/sites/default/files/nasa-std-5020.pdf

Use as a reference material – a lot here but I do not see anyone doing this one in college - Introduction-Mechanisms: Tutorials Point(Inda) Ltd. – also not the easiest to follow.
https://www.youtube.com/watch?v=0uQAPnaW5D4&list=PLWPirh4EWFpEECWjyAysIZ6WIkwHUy72R&ab_channel=TutorialsPoint%28India%29Ltd.

A good lecture series that is not YouTube but does have a tight linking between a book and the lectures.

Machine Design An Integrated Approach by Robert L. Norton - With CD - 4th edition
ISBN13: 9780136123705/ ISBN10: 0136123708

Machine Design - An Integrated Approach 5ed - R. L. Norton
https://media.pearsoncmg.com/ph/esm/ecs_norton_mechdesign_5/videonotes.html

Main Page
https://wps.pearsoned.com/ecs_norton_mechdesign_5/

Solution Manual (4th Edition) – For When You're Out of College and have to brush up on the techniques.
https://www.slideshare.net/ayuobyahya1/machinedesignproblems

PE – Go get some exercise and socializing.

Summer Internship – See Freshman Year Stuff and Work On Your Presentation Skills

Summer Activity: Prepare for the Fundamentals in Engineering Exam

Learn more at the NCEES YouTube channel. [Keeping with the theme of the document.]

ENGR 452: Senior Capstone Design I: Gregory Michaelson (This one is for CE but a bunch crossover to ME and it's pretty easy to figure out which ones.)
https://www.youtube.com/playlist?list=PLCV9OyAY5K-UcIC4udMF2OA3FyG1uyo_U

FE Mechanical Practice Problems (FEMEPP) - At this time, it was $99US and taxes…
https://ppi2pass.com/fe-mechanical-practice-problems.html

Obtaining the NCEES Reference Books for Free (Not to be confused with Sample Tests which are available for a fee.)
https://ncees.org/

About the FE Exam - https://ncees.org/engineering/fe/

Exam Spec for ME - https://ncees.org/wp-content/uploads/FE-Mechanical-CBT-specs.pdf

Exactly what's being tested and how much of each subject is on it. Note: I saw something that said the grading would be done on the lowest number of advertised questions. For example, Mathematics says the number of questions will be 6-9 so 6 will be graded…do not spend your time on all 9 questions…do the ones you're sure of and then come back and due the rest if you have time in that morning session…

Reference Materials and Exam Prep – Verbatim from site…"The NCEES *FE Reference Handbook* is the only reference material that can be used during the exam. You will be provided with an electronic reference handbook during the exam. For access prior to your exam, you may either purchase a hard copy or download a free electronic copy.

Register or log in to MyNCEES to **download your free copy of the *FE Reference Handbook***.
[My input: Note: Registering doesn't mean you've signed up for a test date yet.

Get super familiar with this handbook since it's the only reference book they will allow and furthermore apparently electronically. I used my reference handbook exclusively when studying so that I got to know it very well.]

NCEES offers practice exams. These practice exams contain questions that have been used on past exams and questions written just for study materials to give you extra practice.

The NCEES practice exams now come in paperback print copies. Online practice exams are no longer available. If you have already purchased an online practice exam, you will have access to the exam until the exam is completed or until your purchased time expires.

Learn more about NCEES exam prep materials.

Review the test requirements (https://ncees.org/supplemental/launch-login/myncees-faqs/) and schedule yourself to sit for the exam sometime in your Senior Year. Note many people including myself

took it in the fall of my Senior Year and it’s a good time to do it since you’ve had all of the required courses and they’re fresh in your mind.

Senior Year [Year 4 for International Students]

Fall Semester

Humanities 6 – Student's choice – Psychology 😊

Senior Design I (must have completed Design of Machine Elements)

Introduction to Mechanical Engineering Design (Short but packed with Info for a 6 minute video) Ahmed Samy:
https://www.youtube.com/watch?v=MLXrjF1X0E8&ab_channel=EngineerAhmedSamy

The FAST TRACK to Engineering LEADERSHIP: Becoming an Engineer (Want to be the Project Leader)
https://www.youtube.com/watch?v=BX0q3qTSw2A&ab_channel=BecominganEngineer

NASA's Take on System Engineering and Engineering Design
https://www.nasa.gov/content/systems-engineering-for-university-level-engineering-projects-and-competitions
Systems Engineering for University-level Engineering Projects and Competitions - This series introduces the key products and techniques of systems engineering and how to apply them to your project. The focus is on university-level projects and competitions but is applicable more widely to projects in general.

Introduction to Product Design (Not on YouTube – but course content looked good – first video sound of audience really is terrible but stick it out…use some good headphones to hear the conservation from audience)
http://www.infocobuild.com/education/audio-video-courses/mechanical-engineering/me110-spring2011-berkeley.html

What is a design engineer?: James Dyson's Story – James Dyson Foundation (10 videos)
https://www.youtube.com/watch?v=tRT6m3T-QbQ&list=PLpBQHVUlKs3oTdXfNlI9a8XNCCCgeyMCD&ab_channel=JamesDysonFoundation

Building Prototypes Dan Gelbart
Building Prototypes with Dan Gelbart - YouTube

Design FMEA: Schuster Engineering - Generates your design analysis plan!!
https://www.youtube.com/watch?v=oZ7CSFA-Jd0

MEEN 426: Intro to Geometric Dimensioning and Tolerancing: TheBOM_PE
https://www.youtube.com/playlist?list=PL1IHA35xY5H7HomHQY9nDwifWYvH_Aa1n

Fits and Tolerances: How to Design Stuff that Fits Together
https://www.youtube.com/watch?v=2429BVMrZ4A&ab_channel=tarkka

Stack-Up Analysis: The Essence (a series of 10 short videos)
https://www.youtube.com/playlist?list=PLFyxsGX5OYAaTqMWAvobJ8kJMDIb-cUWM

Video Archive: Tolerance in SOLIDWORKS w/ DimXpert & TolAnalyst: DASI Solutions
https://www.youtube.com/watch?v=bIEd-juIzsg&t=1923s

Screw It! Intro to Fasteners & Bolted Connections: tarkka (Lots of good info – tightly packed – you need to watch at least 5 times and over time since you'll saturate fast)
https://www.youtube.com/watch?v=f7qkHxG1v1E&ab_channel=tarkka

Quick Hitting Reference Materials for Designs Ahmed Samy:
https://www.youtube.com/watch?v=Oj_f6cePu9Y&list=PL-oA7CjSPnwLI7KYpZZ5ZZlfbv9LqavvO&ab_channel=EngineerAhmedSamy
Reference Book: Mechanical and Metal Trades Handbook (Basically the German Version of Machinery's Handbook) Lots of Good Stuff – GD&T, drill sizes, etc.

Do not forget about the ME Resources defined at the beginning of this document either!!! I. E. roymech.org is just one of them that would be valuable in a design course.

ME Technical Elective – Student's choice – Mechanics of Materials 2 (Mechanical System Design and Analysis/Strength of Materials 2)

CPPMechEngTutorials:
https://www.youtube.com/playlist?list=PLZOZfX_TaWAEf5gEjbpazpRTVp2-OzJEv

MEEN 361: Advanced Mechanics of Materials:TheBom_PE:
https://www.youtube.com/playlist?list=PL1IHA35xY5H5AJpRrM2lkF7Qu2WnbQLvS

structurefree:
https://www.youtube.com/playlist?list=PLCBF826FE563C57B0

UWMC Engineering:
https://www.youtube.com/playlist?list=PLmjeuPDHP7zCvwGxZUxQcmRxMFdP5DQOh

ME Technical Elective – Student's choice – One Example Provided Below

Thermodynamics II

CPPMechEngTutorials:
https://www.youtube.com/playlist?list=PLZOZfX_TaWAEraLrZ71gGVWTtzf4SmVTJ

A steam table interpolator tool (complements of reddit u/mrguneer135) and he'd like some feedback on it.
http://www.steam-tables.com/

Interactive Psychrometric Chart
https://drajmarsh.bitbucket.io/psychro-chart2d.html

Randall Manteufel:
https://www.youtube.com/playlist?list=PL_ZIJMd-rNhW1hjzP9PexTRYzQR9Micsq

LearnChemE:
https://www.youtube.com/user/LearnChemE/playlists?view=50&flow=grid&shelf_id=11

Ron Hugo:
https://www.youtube.com/channel/UCrRKDc1uHcif575CQexIA5Q/playlists?view=50&flow=grid&shelf_id=5

UWMC Engineering:
https://www.youtube.com/playlist?list=PLmjeuPDHP7zAgkbNhvk8l9udV5Uu9Uxas

Free Elective – Student's choice

Mechanical Hydraulic Basics Course: Engineering Courses – Not quite the same as Fluid Mechanics…and for ME's usually not "open-channel" flow…
https://www.youtube.com/playlist?list=PLwUQ_AmCS1SwUA1atPDi3VQJkZTNvAJdP

Hydrauilics and Electrical Control of Hydraulic Systems – Jim Pytel
https://www.youtube.com/playlist?list=PLdnqjKaksr8ruhw85YYSSO6EWLhVVmSKm

Hydraulics Math: Columbia Gorge Community College
https://www.youtube.com/watch?v=Bac__zSlZIk&list=PL80B7036DD5260220&ab_channel=ColumbiaGorgeCommunityCollege

Hydraulic Training: cestoner (Note includes Columbia Gorge Community College Videos too).
https://www.youtube.com/playlist?list=PLrgYzCDE-3_aQfsGMcVHGidCTWVJUysBx

TS_ch07 Pneumatic Systems.doc
https://resources.hkedcity.net/res_files/201101/20110128101153_259037.pdf

Job Seeking – Interview Technique Review/Job Fairs/Finding the Right Fit

How To Pass a Job Interview - Interview Preparation MasterClass ✓:Deniz Sasal
https://www.youtube.com/watch?v=9mXG3AiXVMY

Spring Semester

ME Technical Elective – Student's choice – One Example Provided Below

Fluid Mechanics II

CPPMechEngTutorials:
https://www.youtube.com/playlist?list=PLZOZfX_TaWAE7uM59dIBr-rH73WTJCcp_

LearnChemE:
https://www.youtube.com/user/LearnChemE/playlists?view=50&flow=grid&shelf_id=5

ME Technical Elective – Student's choice Applied Engineering Mathematics / Numerical Methods

Engineering Mathematics (UW ME564 and ME565) Steve Brunton:
https://www.youtube.com/playlist?list=PLMrJAkhIeNNR2W2sPWsYxfrxcASrUt_9j

Reference Numerical Methods Book On Line (also links back to YouTube for videos on the numerical methods)
https://nm.mathforcollege.com/

ME Technical Elective – Student's choice

Senior Design 2

MEEN 426: Intro to Geometric Dimensioning and Tolerancing: TheBOM_PE
https://www.youtube.com/playlist?list=PL1IHA35xY5H7HomHQY9nDwifWYvH_Aa1n

Design FMEA: Schuster Engineering - Generates your design analysis and testing plans!!
https://www.youtube.com/watch?v=oZ7CSFA-Jd0

Fits and Tolerances: How to Design Stuff that Fits Together
https://www.youtube.com/watch?v=2429BVMrZ4A&ab_channel=tarkka

Stack-Up Analysis: The Essence
https://www.youtube.com/playlist?list=PLFyxsGX5OYAaTqMWAvobJ8kJMDIb-cUWM

Project Management - Short form (look at video header for times for specific subjects – great for refresher – like start at 50:49) PMP® Certification Full Course - Learn PMP Fundamentals in 12 Hours | PMP® Training Videos | Edureka
https://www.youtube.com/watch?v=vzqDTSZOTic

Job Seeking – More Job Fairs/Finding the Right Fit/Interview Breakdown and Post Analysis

So You've Graduated – What Now? Industry (Congrats you have found a job!) or Academia

Job Advice from u/MustardMan007 = Just finished the first year of my career in mechanical engineering. Figured I'd circle back around and offer some advice. For context, I work in the downstream oil and gas industry as a reliability engineer. Here's some advice I wish I had while I was in school:

-Start brushing up on personal finance knowledge. I promise you, it won't be long before those engineering paychecks start hitting your checking account. Be purposeful and smart with every dollar. Don't wait until you have money to start learning how to manage it.

-Understand that imposter syndrome is completely normal. I was a fresh kid out of college calling myself an "engineer". I had guys with 20 years of maintenance experience coming to me asking what to do about a leaking exchanger. It will make you feel so uncomfortable and out of place. Embrace that feeling- it means you're growing. Understand that your company will have a mountain of resources for you to access. Your most valuable resource is your fellow engineer.

-Don't be afraid to say "I don't know". Don't bullshit your coworkers. They will know and you will look bad. You're just an engineer. Tell them you'll get back with them later. You're not supposed to know everything, you're supposed to know how to figure mostly everything out. School teaches you how to learn. Use that skill.

I know Covid has put a damper on a lot of this. Get your vaccine, get a haircut, take a shower, and get back out there! It's a scary world full of opportunities and experiences.

Industry -Skills to acquire after graduation

How To Pass a Job Interview - Interview Preparation MasterClass ✓:Deniz Sasal

https://www.youtube.com/watch?v=9mXG3AiXVMY - because you never know when you'll need to do one…example when you're bosses boss does an impromptu interview…"when opportunity meets preparation" but doesn't even tell you it's an interview…

r/From Michigan State Mechanical: ***"Do a bit of research on the company benefits (health insurance, 401k, Stock Plans, etc.) These can really add up unexpectedly."*** - I concur looking at the entire package, people can make a job's salary look better by not offering employee benefits and benefits you don't need today, you may really want tomorrow so think longer term than just a year or two down the line. What benefits will be using on a regular basis if you have a family versus being single and not using them at all? Spouses and kids can be an expensive venture (Dental, Medical, Vision, Life Insurance). Good benefits package can represent up to 50% additional salary versus no benefits.

Hey you've got a job…Congratulations…

7 Money Mistakes That Are Easy to Make (and How to Avoid Them): Thomas Frank
https://www.youtube.com/watch?v=8AJ_-Oozn_g

The FAST TRACK to Engineering LEADERSHIP: Becoming an Engineer
https://www.youtube.com/watch?v=BX0q3qTSw2A&ab_channel=BecominganEngineer

Advanced GD&T

Quality Engineering - Advanced Stats – Six Sigma/SPC/MSA/Root Cause Analysis

Troubleshooting or Problem Solving - Root Cause Analysis – One size doesn't fit all and different methodologies for different times in the investigation…

Early Phases of the Investigation:
5 Whys and Fishbone Diagram (Casting the net of possible sources – not to be discussed with Customer since it tends to send everyone in a 1000 directions – thins out investigation resources and obviously has lots of deadends)

Root Cause Analysis Course - 5 Whys and Fishbone Diagram AKA Cause and Effect Diagrams
https://www.youtube.com/watch?v=69XBUdEzKI8

Failure Modes and Effects Analysis (FMEA) – Note there are several different types (PFMEA and DFMEA for process and design failure modes respectively) – Even DFMEA's have different requirements - one for basic understanding (basic Industrial purposes and one for Military/Aerospace Deliverables) The ones below are for the basic idnustrial one that forms a RPN (Risk Priority Number = Severity x Occurance Rate x Detectability) – In troubleshooting, In an investigation, it's kind of a hindsight thing but it's good for seperating design versus process issues and one should see if one was already done both PFMEA and DFMEA before cranking up one on your own.

Really, really short version –
FMEA: How To Perform a Failure Mode and Effects Analysis Tutorial: leansixsigmasource
https://www.youtube.com/watch?v=uzXZd0b_lW4

Another short version
FMEA - What it is and how it works: Dr. Cyders
https://www.youtube.com/watch?v=4Bi8nptcYv0

Later Stages…Apollo Root Cause Analysis (RCA) - Finding the best solution and note that their Cause and Effect Diagrams are not Fishbones!! Some can be shared with customer since at this stage you're trying to convince them you've found the problem and have addressed the issue. Epiphiny here: Most problems exist due to an action (generates the issue) and a condition that lets it happen (allows the defect to continue without detection).

Introduction to the Apollo Root Cause Analysis Methodology: ARMS Reliability
https://www.youtube.com/watch?v=kmQEClQ16ec

Note: This method is difficult to do but will manage your customer effectively…there will not be 1000 corrective actions demanded by the customer to fix the problem. If done correctly, no one will disagree with the results.

Learning about non-distructive testing of metallic parts

Eddy Current Testing: MaterialsScience2000
https://www.youtube.com/watch?v=oriFJBylI6Hs

Magnetic Particle Inspection: MaterialsScience2000
https://www.youtube.com/watch?v=qpgcD5k1494

Dye Penetrant Inspection: MaterialsScience2000
https://www.youtube.com/watch?v=xEK-c1pkTUI

Ultrasonic Testing: MaterialsScience2000
https://www.youtube.com/watch?v=UM6XKvXWVFA

X-ray Inspection and Industrial Computed Tomography: MaterialsScience2000
https://www.youtube.com/watch?v=IcWjZbXiFkM

Hardness Testing (does cause minor damage to the part if location is selected appropriately)

1) Brinell Hardness/ 2) Rockwell Hardness/ 3) Vickers Hardness/ 4) Shore Harness/ 5) Durometer Harness
    1) https://www.youtube.com/watch?v=RJXJpeH78iU
    2) https://www.youtube.com/watch?v=G2JGNlIvNC4
    3) https://www.youtube.com/watch?v=7Z90OZ7C2jI
    4) https://www.youtube.com/watch?v=_QwFPfUq3I8 (Rubber and Plastics)
    5) https://www.youtube.com/watch?v=Q6jn223_1Mw (Rubber and Plastics)

Failure Fatigue and Creep
https://www.youtube.com/watch?v=OcUoolhNDKw

Six Sigma Training Videos: Simplilearn

https://www.youtube.com/playlist?list=PLEiEAq2VkUUIPW1oBXy5PNbdeV1frCQkT

SPC I Statistical Process Control | SPC Video | SPC Explained | SPC Training | Core Tools: Quality Excellence Hub
https://www.youtube.com/watch?v=lOEqli-YV2I

MSA I Measurement System Analysis I MSA Explained | What is MSA | MSA Video | Quality Excellence Hub
https://www.youtube.com/watch?v=GJFLIGmnpzI

Design of Experiments – if not already covered in your Six Sigma Training….

Overview
https://www.youtube.com/watch?v=YUzRSOZuQCQ&ab_channel=Cytiva

Long Version
https://www.youtube.com/playlist?list=PLW-oQRxLODMcYEFXP4eg5EXBl-0hsTSe1

Project Management

PMP Certification Training: edureka
https://www.youtube.com/playlist?list=PL9ooVrP1hQOGpEy_MII3YIp7y0JfJCeDE

Short form (look at video header for times for specific subjects – great for refresher – like start at 50:49)
PMP® Certification Full Course - Learn PMP Fundamentals in 12 Hours | PMP® Training Videos | Edureka
https://www.youtube.com/watch?v=vzqDTSZOTic

Strategic Selling

Miller Heiman Selling
https://www.youtube.com/playlist?list=PLHxE6NeslFWmYx-8tuAV0t58Z-xSKYPq9

Strategic Planning

What should we be doing?

The steps of the strategic planning process in under 15 minutes
https://www.youtube.com/watch?v=HQ6348u6o08

Strategy Development Simplified: What Is Strategy & How To Develop One?: Deniz Sasal
https://www.youtube.com/watch?v=ilS3x3KM_Hs

Getting the organization right to fit the strategy:

McKinsey 7S Framework Explained
https://www.youtube.com/watch?v=DFNJypMOIMI

Goal Setting (Indvidual and Group) and Alignment

Zig Ziglar on Goal Setting
https://www.youtube.com/watch?v=w4peHAfFtTM

System Engineering

Systems Engineering, Part 1: What Is Systems Engineering?: MATLAB
https://www.youtube.com/watch?v=pSfZutP9H-U

Day in the Life of a Systems Engineer: Steve Smith
https://www.youtube.com/watch?v=P5mIaQpliXE

System Engineering Brief: Managing Complexity with a Systems Driven Approach
https://www.youtube.com/watch?v=uEmX7rw0fKg

Space Systems Engineering Unit 3: Project Life Cycle
https://www.youtube.com/playlist?list=PLMrpXL7ZxXYWLoo9JLARsRyRFqp4Fv01N

PE Mechanical Exam

The Principles and Practice of Engineering (PE) exam tests for a minimum level of competency in a particular engineering discipline. It is designed for engineers who have gained a minimum of four years' post-college work experience in their chosen engineering discipline.
https://ncees.org/engineering/pe/mechanical/

See Junior Year for FE write up since much of the same thing (logistics) applies to the PE.

Bored? Entertainment for the ME…

From u/pymae

- Smarter Every Day Destin, (former?) Redstone Arsenal engineer. If "supersonic baseball cannon" doesn't get you excited, then nothing will
- Veritasium More science than engineering, but I think it's a good way to look at more than engineering solutions. It's a good framework for evaluating the big picture.
- Elliot Seguin Elliot is a test pilot in California who worked at Rutan Scaled Composites. A good blend of test pilot and engineering to learn.

From u/craiv

Mechanical engineers must also be aware of what machinists must deal with on a daily basis, how precision parts are manufactured, and how precision is achieved in machining.

My favourites right now are This Old Tony and Blondihacks but there are many others listed in the r/skookum sub sidebar.

From r/Skookum sub sidebar…

Abom79. In depth industrial machining videos.
Alec Steele. Creating beauty with fire, metal, and percussion.
Applied Science. One of those guys that can make cool shit without making a huge mess.
Arduino vs. Evil. Shill free teardowns and neato projects, with a side of dick jokes.
Aussie50 "The content he made is more or less an Austrailian version of our patron saint of bumblefuckery's own.
Dicking around in the shop with whatever was at hand, making cool shit, putting it on the internet."
Great channel. Guy'll be missed.
Bad Obsession Motorsport. Home of *Project Binky*, a highly involved Mini Cooper project.
Big Clive. Electrical device tear downs featuring excessive facial hair.
Chris DePrisco. The guy that built a high performance CNC mill *from scratch*.
Clickspring. Machining true works of art.
Cody's Lab. Proving that you don't need to spend a lot of money to get OSHA to show up.
Electroboom. Desktop electrical engineering from a mind that is both curious and funny.
Engineering Guy. The Stephen Spielberg of technical YouTube videos.
Essential Craftsman. Carpentry with a dose of zero fucks.
Far North Racing. The nuts and bolts of DIY auto racing, from a long time member of the Skookum community.
Jimmy Diresta. Making all kinds of stuff with genuine expertise.
Keith Rucker. Search for and rescue of vintage machinery.
Make it Extreme. Name says it all.
Mathias Wandel. With a name like that, you know he's a wood worker.
NYC CNC. The place to start for aspiring CNC machinists.
Ox Tools. Machining and fabrication at a professional level.
Regular Cars. Bringing social and technical context to automotive journalism.
Smarter Every Day. How good do you have to be at making science videos to score an Obama interview?
SV Seeker. Power boat fabrication.
Taofledermaus. Citizen science for firearm enthusiasts.
The Post Apocalyptic Inventor Using a German accent to make devices with salvaged electronics.
This Old Tony. Machining and top quality dad jokes.
Welding Tips and Tricks. A great resource for amateurs and pros alike.

Adam Savage is also worth following but he has been more about woodworking and model making that I'd like as of recently.

From u/asparagraskalem

1- Learning Engineering It's a classic. You can watch about everything about engineering with quality animation.
2- Interesting Engineering You can find short videos about all engineering stuff or industry.
3- Real Engineering Perfect. Just watch
4- Practical Engineering He show us some engineering problems or basic with the experiments
5- Popular Mechanics About Everything.
6- Engineering Explained As the name implies. It's really cool.
7- Branch Education He show us inside of technological device with animation. Interesting.
8- Spark Documentary about the technological stuff.
9- Seeker Short videos about technology.
10- Newsthink Short videos about industry.
11- The Engineering Mindset The videos about engineering with illustrations and animations.
12- V101 Science About Science
13- The Royal Institution
14- PBS Space Time
15- Driver61 Mostly about motorsports
16- The Efficient Engineer
17- Curious Droid
18- Futurology About industry or something like that
19- Donut Media Probably everybody knows
20- WTF1 About Formula 1